

**BONNEVILLE POWER ADMINISTRATION
JOB STANDARD FOR
POWER SYSTEM ELECTRICIAN APPRENTICE BB 2810 51**

May 25, 2000

I. JOB CHARACTERISTICS

A. General Statement

The Power System Electrician Apprentice works under the direct supervision of a Journeyman Power System Electrician or Electrician Foreman. As an apprentice, the incumbent performs a variety of tasks designed to provide experience which will enhance the apprentice's technical knowledge and skill in the use of the tools and equipment. The Electrician Apprentice performs all duties in compliance with government regulations, BPA safety manual, and the BPA CPTC Collective Agreement.

The Electrician Apprenticeship program is a formal 4-year program consisting of eight steps of 6 months each. The apprentice must pass an end of step review following each 6-month step to remain in this program. Apprentices will be promoted to journeyman after successfully passing the eighth step review and be assigned to vacant journeyman positions as they occur, in accordance with the personnel placement plan in effect at that time.

In addition to satisfactorily completing the on-the-job training portion of the program, the apprentices will complete assigned lessons associated with periodic classroom instruction session and correspondence lessons in electrical trade theory during each step of the apprenticeship program.

To successfully complete this program an apprentice will need to commit approximately 15 hours study each week on average to correspondence lessons, classroom instruction lessons, organizing information acquired during regular work hours, preparing for classroom training and preparing for end-of step reviews.

Failure to perform the required related training satisfactorily will be sufficient cause for removal from the program.

B. Tasks

The Electrician Apprentice, under direct supervision, performs tasks which typically involve installation and adjustment (Construction) or maintenance and repair (Maintenance) of electrical equipment in Substations. The construction tasks include erection of new facilities or removal of old facilities. The maintenance tasks include routine inspection, modification, troubleshooting, and repair of facilities. Equipment serviced may be electrical, hydraulic, mechanical, pneumatic, and/or electronic. Electrician Apprentices work from sketches, drawings, blueprints, wiring diagrams, and instruction books

The apprentice is expected to gain knowledge of the various work processes with progressively difficult assignments throughout their apprenticeship.

The Maintenance work processes are:

Service, and Diagnostic testing of;
Oil circuit breakers
Air blast breakers
SF6 breakers
Power transformers and tap changers
Disconnect switches
Load break disconnects
Engine generators and controls
Static capacitors
Electrical drawing analysis
Stationary batteries and chargers
Substation bus and insulators

Troubleshooting substation equipment
Hazardous waste handling procedures
Safety and First Aid Practices

The Construction Work Processes are:

Conduit installation
Grounding and steel structure assembly
Installation of static capacitors, bus and insulators disconnect
Switches, power circuit breakers, and power transformers
Shop switchboard wiring and assembly
Field switchboard wiring and assembly
Cable pulling and splicing
Outdoor equipment wiring
Electrical drawing analysis

The apprentice will be assigned to various other functions for short terms to learn the following work processes:

1. Substation Operations:
 - Electrical drawing analysis
 - Operation of batteries and chargers
 - Substation operation procedures
 - Switching and clearance tagging procedures

2. Dispatching office assignment:
 - Generation control
 - Outage procedures
 - Switching and dispatching procedures
3. Test and Energization assignments:
 - Energization procedures
 - Testing procedures and safety
4. Division of Laboratories/Field Services:
 - Testing of electrical equipment
5. Transmission Line Maintenance:
 - Rigging Techniques
 - Working under hold orders

C. Working Conditions

Working conditions vary depending on tasks. Most work is performed outside in all weather conditions, but some work is done inside under normal shop conditions. Work is performed around energized equipment, such as switchboards containing critical control circuits where carelessness could cause a serious system disturbance or outage. Work is done in energized substations at various heights in excess of 100 feet, such as on steel framework, platforms, and ladders adjacent to energized high-voltage equipment. The Electrician Apprentice must frequently work on surfaces which are slippery due to insulating oil or ice. Installing conduit, pulling cable, working in oil circuit breaker (OCB) tanks, etc., involves working in restricted and cramped quarters. Approved respiratory and safety equipment shall be worn when hazardous substances are being handled (oil, acid, and solvent fumes, etc.) At times, work may be physically demanding. The work environment will occasionally include high noise levels or exposure to hazardous substances (i.e., mercury, acids, solvents, PCB's, etc.) that could, if precautions are not followed, pose a health risk. Potential exposure to radiation could occur if assigned to work at the WNP2 plant (Ashe & Hanford). Emergencies, critical system conditions, or outage limitations may require working at night or under pressures of time. The Apprentice will be assigned to a Maintenance district for the term of apprenticeship. The Apprentice can expect to be in a travel status approximately 60% of the time, since assignments of up to 3 months away from the headquarters will be required to complete some work processes.

The total costs of tuition, books, and related material will be paid by BPA. The Apprentice will be paid for travel and per diem expenses, in accordance with applicable travel regulations, for expenses incurred in connection with mandatory training, including training on scheduled days off. The time spent traveling to the training site and returning from the training site is the employee's responsibility and is not paid for by BPA.

D. Special Conditions of Employment

Persons filling Power System Electrician Apprentice positions will be required to meet some or all of the following conditions:

1. Satisfactory completion of each step and associated related training is mandatory for advancement to the next step. Failure of any two end-of-step examinations or to demonstrate satisfactory progress will result in removal from the apprenticeship program.
2. If exposed to health hazards, have periodic physical examinations as prescribed by competent medical authority at BPA expense. (Employees will work in close proximity to substances, such as mercury, acids, solvents, or PCB's, which may have effects on health unless prescribed handling procedures are followed.)
3. Become familiar with and follow the safety practices of the BPA Accident Prevention Manual.
4. Establish a residence in accordance with negotiated requirement, that is within our hour or less commuting time under normal weather and road conditions to the duty station headquarters.
5. Possess within the first 2 weeks of the apprenticeship program, and maintain thereafter for the duration of the apprenticeship program, a Restricted Electrical Workers' permit.
6. Possess valid commercial driver's license (CDL) with all endorsements that are required to operate substation maintenance and construction equipment from state of residence. Possess a U.S. Motor Vehicle Operator Authorization or obtain within 30 days after appointment. Traffic citations indicating poor driving habits may disqualify applicants.
7. Become certified on aerial lift equipment or other equipment if assigned to use or operate.
8. Take First Aid training to obtain a valid First Aid Card and CPR Card within the first month of employment and maintain continuously thereafter.
9. Subject to call for emergency work at any time.

10. Participate in all training activities such as training related to hazardous waste handling, oil spill containment and cleanup, and other environmental activities.
11. Be able to wear protective apparel such as respirators when required for worker safety.
12. In addition to successful evaluation of the final review, the Apprentice must pass the current year's Standard Clearance Certification Examination. Satisfactory completion of the clearance certification examination is a mandatory requirement for graduation to the journeyman level.
13. Apprentices may be selected for and relocated to their first assigned duty station following the successful completion of step 6. Per negotiated MOU.
14. The positions at Ashe (Richland) and Pasco require unescorted access to a nuclear facility under the jurisdiction of the Nuclear Regulatory Commission. Final employee selection is subject to successfully completing a background investigation, medical and/or psychological evaluation and pre-employment drug and alcohol testing administered by the nuclear facility management. These positions are also subject to random drug and alcohol testing by the nuclear facility management.
15. Those positions at Ashe (Richland) and Pasco will be required to take annual radiation training and pass a written exam.

E. Responsibilities

The work is performed under the direct supervision of a Journeyman Electrician or Electrician Foreman who outlines the assignments and the objectives and discusses the work. The work is closely reviewed for conformance to instructions, accuracy, completeness, and appropriateness of any actions taken. The apprentice works independently on all aspects of the work for which fully trained as determined by the Electrician Foreman. When working near energized equipment, supervision will be direct and detailed. Guidance in the form of operating instructions and the Accident Prevention Manual is available. The Electrician Apprentice is responsible for good work practices learning the step and related training material, and for completion of tasks in a manner which will insure personal safety, the safety of the crew, and minimize equipment damage or failure and interruption of service. Electrician Apprentices are accountable for government-owned and/or assigned personal property. They are also responsible for the proper care of tools, vehicles, and other work equipment that they use. Electrician Apprentices must comply with all relevant aspects of management directed activities such as programs for the handling and disposal of hazardous waste material.

F. Working Relationships

Relationships outside the crew, in addition to contacts with supervisors and members of other crafts and other crews of the Administration, involve contacts with power dispatchers, representatives of other Offices of the Administration, customer and contractor representatives, occasional contact with manufacturer's representatives and the general public. Since the work involves close relationships on the job, the ability to work cooperatively and harmoniously with fellow crew members is essential.

G. Work Processes and hours –

| <u>Maintenance Work Process</u> | <u>Hours</u> |
|---|--------------|
| Power Circuit Breakers | |
| Oil Circuit Breakers | 400 |
| Air Blast Breakers | 300 |
| SF6 Breakers | 450 |
| Vacuum | 40 |
| Transformer Service | 140 |
| Tap Changers | 100 |
| Testing of Power Transformers | 240 |
| Disconnect Switches (including load breaks) | 180 |
| S&C Switches | 240 |
| Safety & First Aid | 240 |
| Static Capacitors | 240 |
| Battery & Chargers | 180 |
| Bus & Insulators | 100 |
| Conduit | 40 |
| Untanking Tower | 160 |
| Hazardous Waste | 40 |
| Classroom Training | 1300 |
| Total | 4,350 |

| <u>Construction Work Processes</u> | <u>Hours</u> |
|---|--------------|
| Installation & Dryout of Power Transformers | 720 |
| Conduit | 80 |
| Grounding & Steel Structure Assembly | 160 |
| Static Capacitors | 40 |
| Bus & Insulators | 80 |
| Disconnect Switches | 180 |
| Power Circuit Breakers | 160 |
| Shop Switchboard Wiring & Assembly | 240 |
| Field Switchboard Wiring & Assembly | 240 |
| Cable Pulling & Splicing | 120 |
| Outdoor Equipment Wiring | 240 |
| Total | 2,260 |

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|---|-------|
| Substation Operations & Dispatching | 60 |
| Test & Energization | 80 |
| Division of Laboratories/Field Services Section | 80 |
| Electrical Drawing Analysis | 240 |
| Troubleshooting Electrical Equipment | 240 |
| System Protection & Control/Relaying | 40 |
| Total | 740 |
| GRAND TOTAL | 7,350 |

II. MINIMUM QUALIFICATION STANDARDS/EVALUATION FACTORS

A. Knowledges, Skills, and Abilities

Candidates will be evaluated on the basis of a written examination, experience, education, training, supervisory appraisal and/or potential on the following job elements to determine those who are minimally qualified and those who are best qualified.

1. APTITUDE AND INTEREST TO LEARN TRADE THEORY. (Failure to meet this requirement will result in an ineligible rating.)
2. Ability to follow directions.
3. RELIABILITY AND DEPENDABILITY. (Failure to meet this requirement will result in an ineligible rating.)
4. Dexterity and Safety.
5. Ability to use prints and drawings.
6. Experience and Interest.

B. Physical Requirements

Incumbents must be physically and mentally able to efficiently perform the essential duties of the position, with or without reasonable accommodation, without hazard to themselves or others. The work requires extensive bending, pushing, pulling, reaching, and climbing; occasional crawling; and working in cramped confined positions. Incumbents must be able to handle small, light components in the wiring, assembly installation and repair of switchboards or the repair of miscellaneous equipment. Some tasks, such as installing conduit and pulling wire, involve heavy manual labor. Must be able to distinguish clearances around machinery with moving parts. Incumbents must be able to perform strenuous tasks that include loading or unloading crates from storage locations, removing or replacing heavy assemblies in relatively inaccessible locations, and moving bulky or awkward objects such as extension ladders, bales of rags, reels of wire, or test apparatus. Must be able to lift and carry loads weighing up to 75 pounds.

Must be able to move and position equipment and materials weighing over 75 pounds such as SF 6 gas cylinders, capacitors, etc. Must be able to work at heights in excess of 100 feet. Incumbents must be able to work with both arms overhead. Must be able to periodically wear protective apparel which includes respirators. Extensive driving over unimproved surfaces may be required. Work may be performed on smooth or uneven surfaces and will be performed under varying climatic conditions. Incumbents must have good distance vision in at least one eye and have the ability to read printed material the size of typewritten characters. They must be able to distinguish different electrical components based on color coding or shade variations. They must have the ability to hear the conversational voice. Speech must be suitable for clear communication by telephone. Incumbents must be in good physical condition sufficient to safely perform the duties of the position.

III. CAREER PATHS AVAILABLE

Electrician
Electrician Foreman I (Construction/Maintenance)
Electrician Foreman II (Construction/Maintenance)
Electrician Foreman III(T)
Electrician Foreman III (Construction/Maintenance)

IV. COMPETITIVE LEVEL FOR REDUCTION IN FORCE

Power System Electrician Apprentice

WHO
Division of Personnel Management